
Gingivae contain neural-crest- and mesoderm-derived mesenchymal stem cells.

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Public Summary:

In summary, our study indicates that the gingivae contain both neural-crest- and mesoderm-derived mesenchymal stem cells with distinctive stem cell properties.

Scientific Abstract:

Gingivae represent a unique soft tissue that serves as a biological barrier to cover the oral cavity side of the maxilla and mandible. Recently, the gingivae were identified as containing mesenchymal stem cells (GMSCs). However, it is unknown whether the GMSCs are derived from cranial neural crest cells (CNCC) or the mesoderm. In this study, we show that around 90% of GMSCs are derived from CNCC and 10% from the mesoderm. In comparison with mesoderm MSCs (M-GMSCs), CNCC-derived GMSCs (N-GMSCs) show an elevated capacity to differentiate into neural cells and chondrocytes and induce activated T-cell apoptosis in vitro. When transplanted into mice with dextran sulfate sodium (DSS)-induced colitis, N-GMSCs showed superior effects in ameliorating inflammatory-related disease phenotype in comparison with the M-GMSC treatment group. Mechanistically, the increased immunomodulatory effect of N-GMSCs is associated with up-regulated expression of FAS ligand (FASL), a transmembrane protein that plays an important role in MSC-based immunomodulation. In summary, our study indicates that the gingivae contain both neural-crest- and mesoderm-derived MSCs with distinctive stem cell properties.

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